DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

Test report No:

NIE: 60063REM.001A1

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (May 17, 2019 Edition) & ICES-003 Issue 6 (Updated 04-2019)

Identification of item tested	Ring with 9x5 Led matrix and 3 buttons. 60mAh battery, USB connector, BLE radio
Trademark	Wave by Genki Instruments
Model and /or type reference tested	G1W1
Other identification of the product	HW Version: 0201 SW Version: SWR1 FCC ID: 2ATPJ-G1W1 IC: 24946-G1W1
Features	Bluetooth BLE radio, USB micro connector for charging. 9x5 LED matrix display, 3 buttons.
Manufacturer	Genki Instruments, Eidistorg 13-15, 170, Seltjarnarnes ICELAND
Test method requested, standard	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition) Sec. 15.109 & ICES-003 (Updated 04-2017)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López EMC LAB Manager RAFAEL LÓPEZ MARTÍN 2019.07.31 11:24:34 +02'00'
Date of issue	2019-07-30
Report template No	FDT08_22

Index

Competences and guarantees 3
General conditions 3
Uncertainty 3
Data provided by the client 4
Usage of samples 4
Test sample description 4
Identification of the client 5
Testing period and place 5
Document history 5
Environmental conditions 6
Remarks and comments 7
Testing verdicts 7
Summary 7
List of equipment using during the test 7
Appendix A: Test results 8

Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is a FCC recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report, FCC designation number ES0004.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification internal document PODT000.

The total uncertainty of the measurement system for the measured conducted disturbance characteristics of EUT from 150kHz to 30 MHz is I = ± 3,9 dB for quasi-peak measurements, I = ± 3,2 dB for average measurements (k = 2)

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is I = ± 4,9 dB for quasi-peak measurements, I = ± 4,6 dB for peak measurements (k = 2)

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 1000 MHz to 26 GHz is I = ± 2,6 dB for peaks and average measurements (k = 2)

Data provided by the client

Product sends MIDI (Musical Instrument Digital Interface) data over the BLE to control (musical) devices based on the mode of the ring and gestures made with the ring.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples under test have been selected by: The client.

Sample S/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
60063/006	Ring	G1W1	---	2019-05-07

Test sample description

Ports…… :	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded		
	Not provided data			☐	☐		
				☐	☐		
				☐	☐		
				☐	☐		
				☐	☐		
Supplymentary information to the ports…… :	Not provided data						
Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 5Vdc (By USB port)					
	☐	DC:					
Rated Power .....:	Not provided data						
Clock frequencies .....:	Not provided data						
Other parameters.....:	FCC ID: 2ATPJ-G1W1 IC: 24946-G1W1						
Software version .....:	SWR1						
Hardware version.....:	0201						
Dimensions in mm (W x H x D)...:	Not provided data						

Mounting position.....:	☒	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Hand-held equipment
	☐	Other: Vehicle

Modules/parts .....:	Module/parts of test item	Type	Manufacturer
	Not provided data		

Accessories (not part of the test item) .....:	Description	Type	Manufacturer
	Not provided data		

Documents as provided by the applicant.....:	Description	File name	Issue date
	Not provided data		

Identification of the client

Genki Instruments,
Eidistorg 13-15, 170, Seltjarnarnes ICELAND

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2019-05-07
Date (finish)	2019-05-17

Document history

Report number	Date	Description
60063REM.001	2019-07-11	First release
60063REM.001A1	2019-07-30	Second release, replacing the radiated emission limits table by the correct one

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The test have been performed by the technical personnel: Antonio Ruiz.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

Emission Test		
Requirement – Test case	**Verdict**	**Remark**
Radiated emission. Electromagnetic field measure (30 KHz – 1000 MHz)	P	---
Radiated emission. Electromagnetic field measure (1 GHz – 18 GHz)	P	---
Continuous conducted emission (150 KHz – 30 MHz)	N/A	(1)
Supplementary information and remarks: (1) Equipment DC powered and it is not considered a peripheral device.		

List of equipment using during the test

Control Number	Description	Model	Manufacturer	Last Calibration Date	Next Calibration
0246	HORN ANTENNA 1-18GHz	11966E	HEWLETT PACKARD	2018-10-13	2021-10-13
3545	USB TEMPERATURE AND HUMIDITY SENSOR	HUMIDIPROBE	PICO TECHNOLOGY	2019-04-03	2020-04-03
3547	USB TEMPERATURE AND HUMIDITY SENSOR	HUMIDIPROBE	PICO TECHNOLOGY	2019-04-03	2020-04-03
6135	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2019-04-04	2020-04-04
6666	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2018-02-14	2020-02-14
6815	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2019-02-01	2022-02-01

Appendix A: Test results

APPENDIX A CONTENT

DESCRIPTION OF THE OPERATION MODES.....10
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE.....11

DESCRIPTION OF THE OPERATION MODES

The operation modes used by the samples to which the present report refers, are shown in the following table:

OPERATION MODE	DESCRIPTION
OM#01	EUT ON. USB charging batteries. BTLE in RX mode. Power supply: 5Vdc. (By USB port)

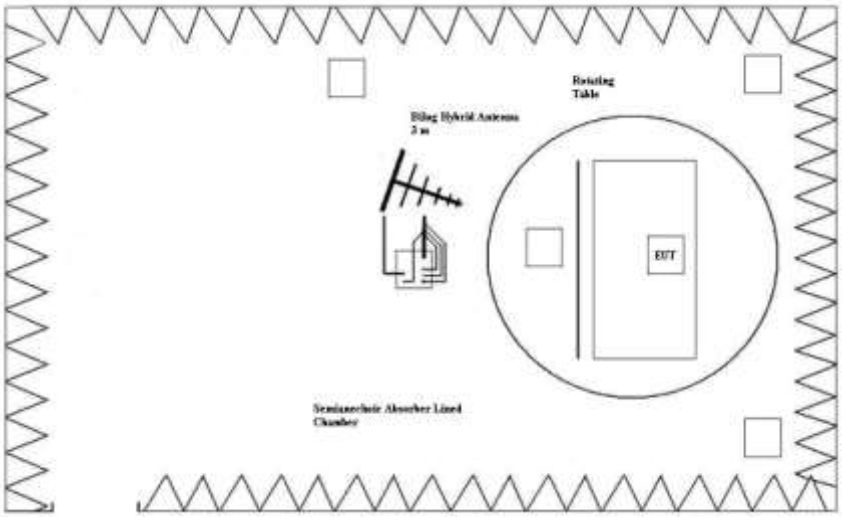
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition) & ICES-003 (Updated 04-2017)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition) & ICES-003 (Updated 04-2017)

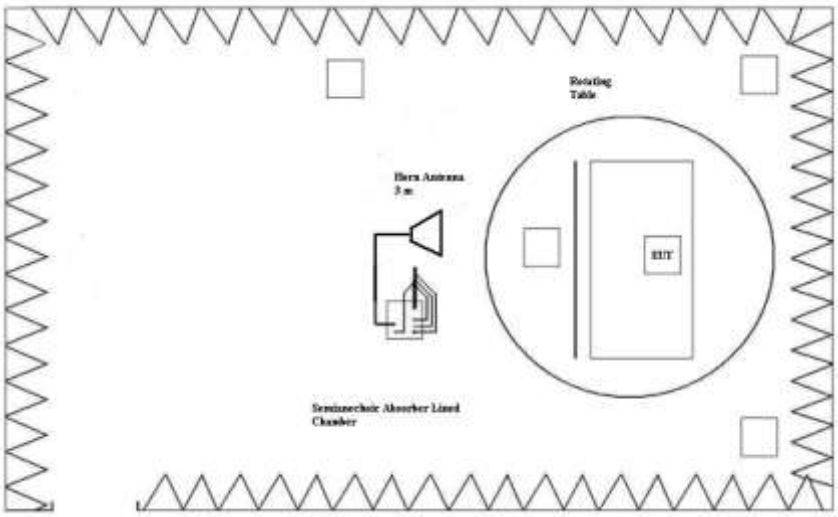
Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (May 17, 2019 Edition), Secs. 15.109 & ICES-003 Issue 6 (Updated 04-2019).

Frequency of emission (MHz)	Field strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

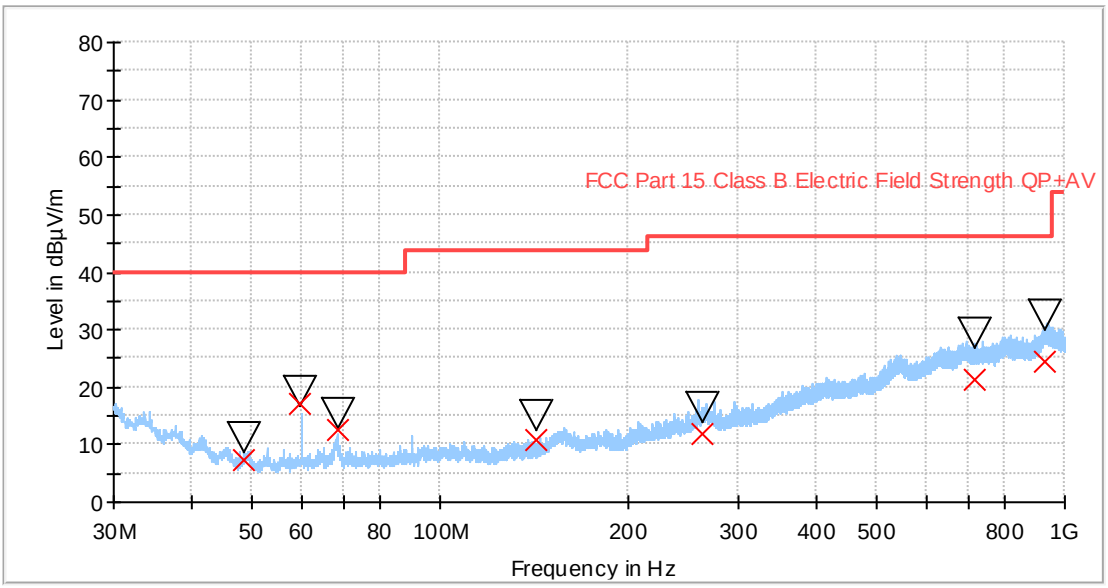
TESTED SAMPLE:	S/01
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization.

CRmmnnRRPP	Description	Result
CR0101LR	Range: 30 MHz - 1000 MHz.	P
CR0101HR1_H	Range: 1 GHz – 18 GHz. Horizontal polarization.	P
CR0101HR1_V	Range: 1 GHz – 18 GHz. Vertical polarization.	P

Radiated Emission. CR0101LR

Project:	60063REM.001
Operating Conditions:	GRANT4COM OY
Operator Name:	S/01 MO/01
Comment:	EUT ON. USB charging batteries. BTLE in RX mode. Power supply: 5Vdc (usb)

Full Spectrum



Peak Preview
MaxPeak
FCC Part 15 Class B Electric Field Strength QP+AV
QuasiPeak

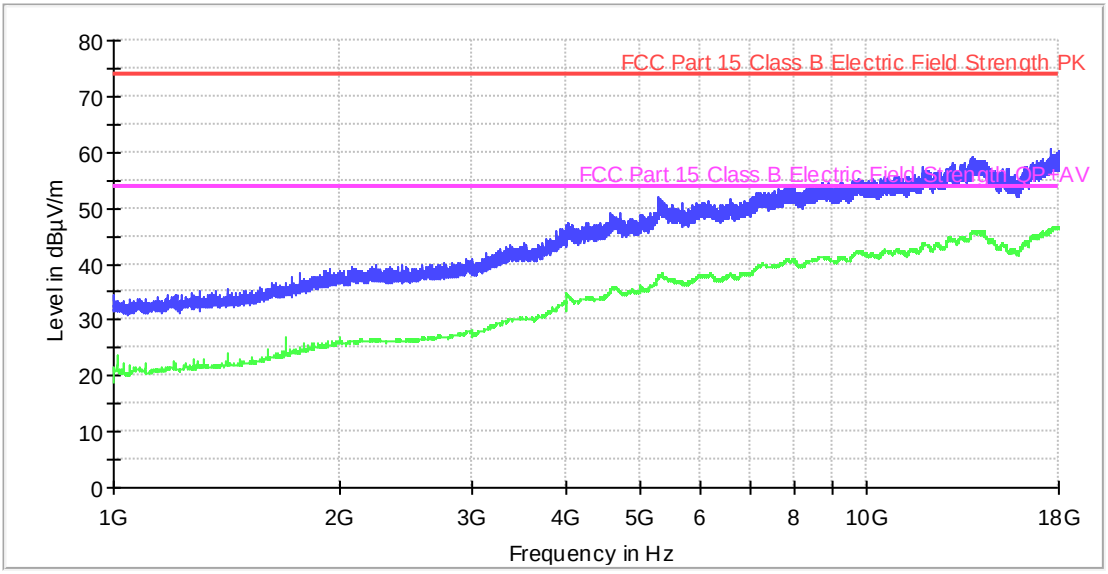
Maximizations

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
48.305000	11.08	7.48	104.0	V	135.0
59.765000	19.06	17.00	395.0	H	88.0
68.450000	15.53	12.55	131.0	V	158.0
142.405000	14.85	10.77	200.0	H	9.0
263.635000	16.50	11.97	215.0	V	61.0
719.545000	29.19	21.37	132.0	H	314.0
930.285000	32.43	24.51	129.0	V	216.0

Radiated Emission. CR0101HR1_H

Project:	60063REM.001
Company:	GRANT4COM OY
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. USB charging batteries. BTLE in RX mode. Power supply: 5Vdc (usb)

FCC 1-18GHz class B



Average Scan
Peak Scan
FCC Part 15 Class B Electric Field Strength PK
FCC Part 15 Class B Electric Field Strength QP+AV

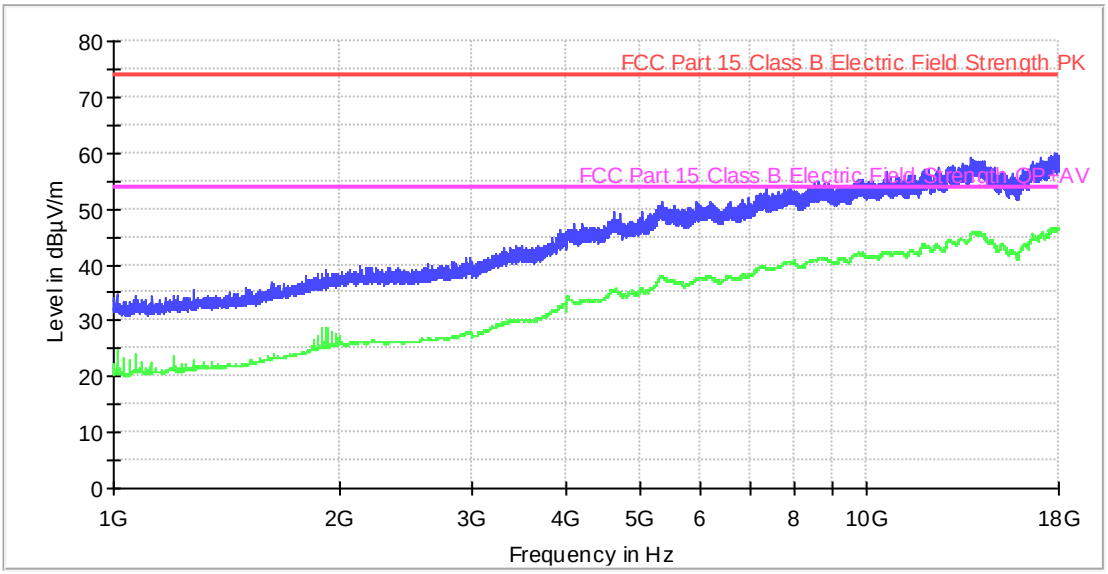
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
1300.400000	35.2	21.7
1768.000000	38.2	24.2
2226.000000	39.9	26.4
3130.400000	42.0	28.3
4013.200000	47.3	34.4
5289.600000	52.2	37.7
7526.000000	53.3	39.7
9755.200000	55.3	42.1
13479.600000	58.3	44.6
17615.200000	60.5	46.4

Radiated Emission. CR0101HR1_V

Project:	60063REM.001
Company:	GRANT4COM OY
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. USB charging batteries. BTLE in RX mode. Power supply: 5Vdc (usb)

FCC 1-18GHz class B



Average Scan
Peak Scan
FCC Part 15 Class B Electric Field Strength PK
FCC Part 15 Class B Electric Field Strength QP+AV

Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
1278.800000	35.4	21.7
1780.400000	37.0	24.2
2128.800000	39.8	26.2
2978.400000	41.3	27.8
4080.800000	47.5	33.2
5358.400000	51.4	37.8
7342.000000	53.7	39.5
9800.000000	55.4	42.0
13433.200000	58.1	44.6
17859.200000	60.0	46.4